

REMARKS

Claims 1-50 are pending. Claims 20-50 were withdrawn by the Examiner. Claims 51 and 52 are newly added and are based on claims 9 and 10, which were indicated by the office action as being allowable if rewritten in independent form including all the limitations of the base claim (with the exceptions of the R groups) and any intervening claims.

Continued Examination under 37 CFR 1.114

The office action indicates in paragraph #2 on page 2, that the amendment filed November 9, 2006 has been entered and that claims 20-50 have been canceled. However, Applicant notes said amendment makes no indication of canceling claims 20-50. Clarification on the status of claims 20-50 is respectfully requested.

Specification

The office action states that the disclosure is objected to because the formula “-C(C=O)-R-COG” listed on page 2, lines 14, 16 and 17, and on page 4, lines 7, 9 and 10 of the specification is said to be incorrectly written. Accordingly, Applicant has amended the specification, substituting for the objected formula “-C(C=O)-R-COG” on pages 2 and 4, with the following formula: “-C(=O)-R-COG”. No new matter has been entered. In view of the amendment, Applicant respectfully requests withdrawal of the objection.

Claim Rejections – 35 USC § 112, 1st Paragraph

Claim 11 is rejected under 35 U.S.C., 112, first paragraph, as failing to comply with the written description requirement. The Office action states that Applicant’s amendment to claim 11 inserts new matter since the specification as originally filed does not provide support for the compounds “N,O-carboxymethyl-N-succinylchitosan, N,O-carboxymethyl-N-citraconylchitosan, N,O-carboxymethyl-N-glutarylchitosan as subunits of the instantly claimed N-acylated chitinous polymer.

Applicant has amended claim 11 so that the alleged new matter is removed from the

claim. Support for the newly added term “polymer” is found in paragraph 35 of the instant application published as US 20050214255. In view of the above remarks and amendments, Applicant respectfully requests reconsideration and withdrawal of the instant rejection.

Claim Rejections – 35 USC § 102

Claims 1-8 and 11-19 are rejected under 35 U.S.C 102(b) as being anticipated by Elson (U.S. Patent No. 5,888,988).

Turning to the rejections under 35 U.S.C. § 102(b) over the Elson U.S. Patent No. 5,888,988, Applicants respectfully disagree with his interpretation of both the present claims and the ‘988 patent. The passage cited by the Examiner concerns the use of succinic acid as a bridging agent, bridging between an amino group and a carboxyl group. This molecule is formed by a reaction of NOCC and succinic anhydride. As shown in the attached declaration of Susan Henderson, this leads to a succinylated NOCC that has a high percentage of the carboxyl groups in the form of carboxymethyl. This is an entirely different molecule than the N,O-carboxymethyl-N-succinylchitosan claimed in claim 11 and encompassed by claim 1 of the present application as amended.

Claim 1 has been newly amended to further distinguish the claimed invention from the cited reference by requiring that the recited N-acylated chitinous polymer have a degree of carboxylation from the carboxymethyl group that is lower than the degree of carboxylation from the R group. Support for this newly added limitation is found in Examples 1 and 2 of the specification.

The methods of formulating the two molecules led to this different result. The ‘988 patent uses the reaction of NOCC with a bridging agent, e.g., succinic anhydride, to form an amide bond with the succinic acid group, which results in a degree of succinylation of about 0.3, see attached declaration of Susan Henderson. Since the degree of carboxylation is 1.3, this means that most of carboxylation is in the form of carboxymethyl rather than succinate groups. In contrast, the present invention reacts chitosan with the anhydride to form N-succinylchitosan which is then modified to form the NOCC derivative. This causes a different chemical entity to form, having a degree of succinylation of 0.9, and a degree of carboxylation of 1.2, see Example

2 of the specification. Thus, the N-acylated chitinous polymer taught by Elson in U.S. Patent 5,888,988, which was made through the succinylation of NOCC, has a degree of carboxylation in the form of carboxymethyl groups which is higher than the degree of carboxylation from the R group (or succinate); and thus does not fall under the scope of instant claim 1 and its dependent claims. In contrast, if made using the present procedure, the carboxylation for carboxymethyl groups must be lower than that for the R group. Thus, the present claims require that the instantly claimed N-acylated chitinous polymer have a degree of carboxylation from the carboxymethyl group that is lower than the degree of carboxylation from the R group. Therefore, the Elson patent is not anticipatory.

In view of the above remarks and amendments, Applicant respectfully requests reconsideration and withdrawal of the instant rejection.

Allowable Subject Matter

The office action states that claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if re-written in independent form including all of the limitations of the base claims (with the exception of the R groups) and any intervening claims.


Accordingly, Applicant has newly added independent claims 51 and 52 designed to represent the allowable subject matter of claims 9 and 10 and incorporating the limitations the rejected base claim 1 as recited at the time of the office action dated March 19, 2007, as opposed to claim 1 as newly amended.

Conclusion

Applicants believe that the claims, as amended, are clear and distinct from the art.
Prompt notification of allowance is requested.

Respectfully submitted,

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